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File A-101

27 November 1957

CMCC Doc. No. 151X5.867

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Dear Dick:

We are forwarding herewith Progress Letter No. 14 covering work performed on System No. 4 during the period extending from 16 October of 15 November 1957.

Sincerely,

Burt

Burt

Enclosures:

CMCC Doc. No. 163X5.53

Copies 1-8 of 12

DOCUMENT NO. 14
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Progress Letter No. 14

Contract No. A-101

System 4

16 October to 15 November 1957

CMCC Document No. 163X5.53

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including this title sheet.)

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1. General

During the period covered by this progress letter, the following work was performed:

- (1) Construction of Model 103 of System 4 was essentially completed.
- (2) Testing of units for Model 103 was initiated.
- (3) Construction of the prototype preflight test set was essentially completed and subassembly testing was completed.
- (4) Construction of Model 104 of System 4 was initiated.

2. Production

During the report interval, production Model 103 of System 4 was essentially completed. At the close of this period equipment assembly was complete except for minor subassemblies in the Band 1 receiving equipment. Completion of these items has been delayed due to delays in delivery of fabricated parts. However, substitution of breadboard versions of the incomplete subassemblies has permitted tests to proceed. With the exceptions noted above, all subassemblies were tested and all major units of the system are now in unit test.

3. Preflight Test Set

Construction of the preflight test set was completed during this period with the exception of internal rack wiring for the terminal equipment rack. Construction of all subassemblies for the test set has been completed with the exception of some minor fabricated parts. However, all subassemblies have been electrically completed and tested.

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4. Planning

During the next reporting interval the following work is scheduled:

- (1) Construction of Model 104 of System 4 will be essentially completed and subassembly tests will be initiated.
- (2) Unit, environmental, and system tests will be completed on Model 103 and the system will be delivered to the field for acceptance tests.
- (3) Construction and test of the prototype preflight test set will be completed and the equipment will be made available for delivery concurrently with Model 103.

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October 24, 1957

CMCC Doc. No. 151X5.799
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Dear Dick:

We are forwarding herewith eight copies of Monthly Progress Letter No. 13, covering work performed on System No. 4 during the period extending from 1 September to 15 October 1957.

Sincerely,

Burt

Burt

Enclosures:

CMCC Doc. No. 163X5.51
Copies 1-8 of 12

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Encl. #1 to
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Progress Letter No. 13

Contract No. A-101

System 4

1 September to 15 October 1957

CMCC Document No. 163X5.51

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1. General

During the period covered by this progress letter, the following work was accomplished:

- (1) Environmental tests were performed on the first and second production models of System 4 and corrective measures were applied.
- (2) The first production model was subjected to further flight testing both before and after environmental test.
- (3) The first and second production models of System 4 were delivered.
- (4) Fabrication of the third production model was advanced.
- (5) Design work on the preflight test set was essentially completed.

2. Environmental Test

- a. At the start of the report period a request was submitted to the customer for authorization to conduct environmental testing on the major units of System 4. This was felt to be necessary since previous flight testing, while showing that failures occurred, did little to indicate the reasons for such failures.
- b. On 16 September 1957, a program was instituted to accelerate testing of the first and second production models of System 4 to permit delivery on or before 30 September. This program called for an intensive effort to carry System 4 through environmental test and to provide corrective measures where necessary. After environmental test, the first production model was flight tested to determine its ultimate suitability.
- c. The environmental test was two-fold in attack. First, steps were taken to provide an over-all environmental test of the

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complete system under conditions approaching those actually encountered in practice. Concurrent with this, units known to have environmental weaknesses were subjected to detailed environmental tests at the unit level.

d. By 24 September 1957, all major environmental problems appeared to have been solved and the first production model of the system was released to the field for further flight test. The second production model was subjected to the same order of environmental testing as the first production model, but was not subjected to flight test.

e. The results of environmental test indicate that nearly all of the problems thus far encountered have been the result of high-voltage breakdown at operating altitude. The units which were particularly troublesome in this respect were the local oscillator circuitry for the Bands 6 and 7 receiving equipments, the high voltage circuitry associated with the camera-indicator equipment, and the 1600-volt power supply which supplies operating potentials for the local oscillator circuitry of the Bands 6 and 7 receiving equipments. Corrective measures consisted of re-routing of wiring, corona-doping, and in some cases, change of components.

3. Flight Testing

a. During this period a total of four flight tests were made using the first production model. On 5 September 1957, a flight test was made to provide an environmental check. After approximately ten minutes of operation, a system power failure occurred, apparently due to high voltage failures.

b. On 12 September 1957, another environmental flight test was made. On this flight a pilot's indicator was installed to indicate in a gross sense the operability of System 4. The flight was planned for two hours but the indicator showed system failure after 20 minutes of flight.

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c. The next flight test performed on the first production model occurred on 25 September 1957, after environmental test procedures had been applied. This flight was of approximately two hours duration. Compared to previous flight tests, this flight was highly successful. No power failures occurred, and all receivers in the system showed much activity during the test period. It was observed that the tape record was excellent, although the video record appeared somewhat erratic. On this flight the Band 6 receiver was not included, since corrective measures applied as a result of environmental test delayed its delivery to the test site. However, the receiver was delivered in time for the flight test on 26 September 1957.

d. On 26 September, a major evaluation test of four and one-half hours duration was performed. In this test, known signal sources were established to provide a means for evaluating system performance. During this flight no gross power failures occurred. Slewing difficulties developed in the Band 1B receiver after one hour and fifteen minutes of operation, and slewing difficulties occurred in the Bands 6 and 7 receivers shortly after operation commenced. These difficulties were not discovered until the data reduction process was instituted, since post-flight checks showed the offending receivers to be operating satisfactorily. Due to an oversight in the preflight check, the video signal circuit was not connected in the indicator. Consequently, no video recording was obtained, although the film did show evidence of acceptable camera indicator performance in terms of raster presentation.

4. Production

During this report period production of Model 103 was continued. Construction is still under way in some phases, although many sub-assemblies have been assembled and tested, and several major units were undergoing unit test at the end

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of the report period. It appears that system test of Model 103 will start in mid-November.

5. Preflight Test Set

a. It was planned originally that a prototype test set would be delivered concurrently with the first or second production model of System 4. However, the accelerated effort to deliver these production models by the 30th of September made it impractical to deliver the prototype test set concurrently. To provide the maximum practicable amount of testing and maintenance capability for the field, it was necessary to increase the equipment in the contemplated SLOE list. All available commercial and special test equipment considered for use in the test set was included in this list.

b. The prototype test set design has been essentially completed and final assembly, construction, and test of the prototype model will be completed by mid-November.

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